

**CLAIM AMENDMENTS**

This listing of claims will replace all prior versions and listings of claims in the application.

**Listing of Claims**

1-35. (Canceled)

36. (Currently Amended) A method of accessing the a transport header of packets having extension headers, wherein the packets belong to a particular traffic flow, the method comprising the steps of:

(a) reading header information from the packets;  
~~and, if said packet includes extension headers,~~  
building a cache key from said header information;

(b) using said cache key to perform a cache lookup;  
adding an unpredictable flow mark to the particular traffic flow when said extension headers are constantly changing;

(c) if-when the particular traffic flow has the unpredictable flow mark no  
~~extension header data is found in a cache,~~ performing a serial traversal of said extension headers; and

13        when the particular traffic flow does not have the unpredictable flow mark,  
14        storing data read from said extension headers in said cache; and  
15        (d) if-when extension header data is are found in said cache, using said  
16        extension header data to load said extension headers in parallel in order to reduce a  
17        time required to traverse said extension headers.

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1        37. (Currently Amended) The method defined in claim 36, wherein the ~~packet is~~  
2        packets are an IPv6 packet packets.

1        38. (Currently Amended) The method defined in claim 36, further comprising:  
2        ~~wherein~~  
3        building said cache key is built from two fields of ~~the~~ an Internet header of  
4        the packet packets.

1        39. (Currently Amended) The method defined in ~~claim 36~~ claim 38, wherein:  
2        the two fields used to build the cache key are an IP source address field and a  
3        flow label field for packets that have a flow label, and  
4        an IP source field and a destination address field for packets that do not have  
5        a flow label.

1 40. (Currently Amended) The method defined in claim 36, wherein the cache key  
2 is built from a source address, a flow label, and a next header for a packet that has  
3 a flow label, or from a source address, ~~and a destination addresses-address~~, and a  
4 next header for a packet that does not have a flow label.

1 41. (Currently Amended) The method defined in claim 36, further comprising:  
2 ~~wherein~~  
3 performing the cache lookup ~~is performed~~ using a table containing lengths of  
4 said extension headers.

1 42. (Currently Amended) The method defined in claim 36, wherein said extension  
2 headers include a first extension header and additional extension headers, and  
3 further comprising:  
4 reading ~~where said first extension header is read~~ while said cache lookup is  
5 being performed on said additional extension headers.

1 43. (Currently Amended) The method defined in claim 36, further comprising:  
2 ~~the step of,~~  
3 if when a subsequent packet has a same cache key but additional extension  
4 headers, serially traversing said additional extension headers and updating said  
5 extension header data by storing additional extension header data.

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1 44. (Currently Amended) The method defined in claim 36, further comprising:  
2 ~~the step of~~  
3 detecting whether ~~a packet includes the~~ packets include hop-by-hop and  
4 routing extension headers ~~and omitting steps (c) and (d) if said hop-by-hop and~~  
5 ~~routing extension headers are detected.~~

1  
1 45. (Currently Amended) The method defined in claim 36, further comprising:  
2 ~~wherein if~~ when a subsequent packet has a same cache key as a packet for  
3 which extension header data ~~is~~ are stored in said cache but the extension header  
4 data ~~does not~~ match extension headers in the subsequent packet, ~~skipping step~~  
5 ~~(d) and instead performing a serial traversal of said extension headers in the~~  
6 subsequent packet.

1 46. (Canceled)

1  
2 47. (New) A method of accessing a transport header of packets having extension  
3 headers, wherein the packets belong to a particular traffic flow, the method  
4 comprising:

5 reading header information;

6 building a cache key from said header information;

7 using said cache key to perform a cache lookup;

8 adding an unpredictable flow mark to the particular traffic flow when said  
9 extension headers are constantly changing;

10 when extension header data are not found in a cache:

11 incrementing a cache failure count,

12 performing a serial traversal of said extension headers, and

13 storing data read from said extension headers in said cache when said  
14 cache failure count exceeds a predetermined threshold and the particular  
15 traffic flow does not have the unpredictable flow mark; and

16 when extension header data are found in said cache, using said extension  
header data to load said extension headers in parallel in order to reduce a time

required to traverse said extension headers, when the particular traffic flow does not have the unpredictable flow mark.

48. (New) A method of accessing a transport header of packets having extension headers, wherein the packets belong to a particular traffic flow, the method comprising:

- reading header information;
- building a cache key from said header information;
- using said cache key to perform a cache lookup;
- adding an unpredictable flow mark to the particular traffic flow when said extension headers are constantly changing;

- classifying the packets while verifying that cached protocol information matches the packets;

- when said verifying fails, performing said classifying again with information from an upper-layer header of the packets;

- when no extension header data are found in a cache, performing a serial traversal of said extension headers, and storing data read from said extension headers in said cache when the particular traffic flow does not have the unpredictable flow mark; and

17           when extension header data are found in said cache, using said extension  
18   header data to load said extension headers in parallel in order to reduce a time  
19   required to traverse said extension headers when the particular traffic flow does not  
20   have the unpredictable flow mark.